Kramer Electronics, Ltd.

USER MANUAL

Models:

TP-41, ***Component – S/PDIF Line Transmitter***

TP-42, ***Component – S/PDIF Line Receiver***

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing your Kramer TOOLS **TP-41** *Component – S/PDIF Line Transmitter* and Kramer TOOLS **TP-42** *Component – S/PDIF Line Receiver*, which are ideal for high-quality home cinema.

The **TP-41** and **TP-42** can use existing UTP cabling that results in an efficient, fast and uncluttered environment for:

- Studios, airports, offices and hospitals
- Security and military applications

The package includes the following items:

- **TP-41** and/or **TP-42**
- Power supply[2], and this user manual[3]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[4]

1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

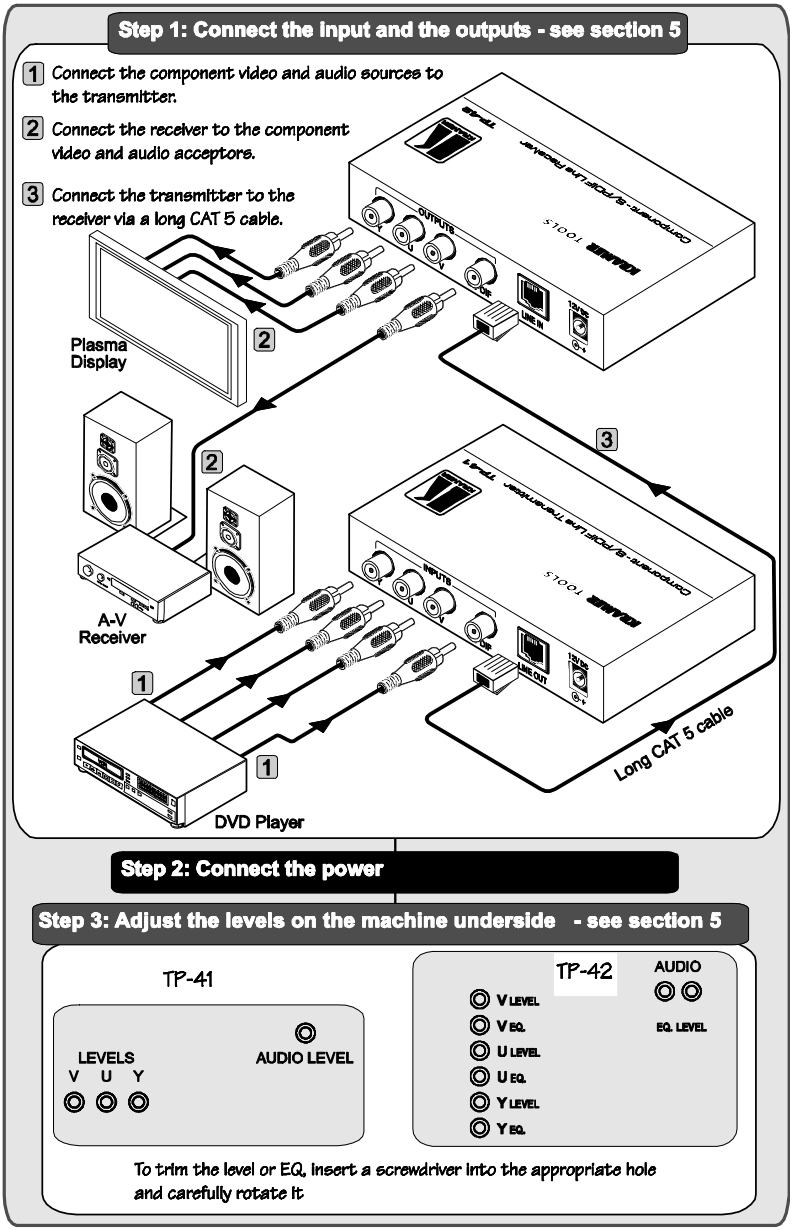
2 A separate power supply is included with each product. As an option, you can purchase the Kramer VA-50P 6-Port Universal 12-Volt Power Supply, that supplies power to up to 6 Kramer devices that require 12V DC

3 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

4 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.


Step 1: Connect the input and the outputs - see section 5
1 Connect the component video and audio sources to the transmitter.
2 Connect the receiver to the component video and audio acceptors.
3 Connect the transmitter to the receiver via a long CAT 5 cable.
Plasma Display
A-V Receiver
DVD Player
Long CAT 5 cable
Step 2: Connect the power
Step 3: Adjust the levels on the machine underside - see section 5
TP-41
LEVELS
V U Y
AUDIO LEVEL
TP-42
AUDIO
V LEVEL
V EQ.
U LEVEL
U EQ.
Y LEVEL
Y EQ.
EQ. LEVEL
To trim the level or EQ, insert a screwdriver into the appropriate hole and carefully rotate it

3 Overview

This section describes:

- A summary of the **TP-41**, **TP-42**, see section 3.1
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see section 3.2
- Recommendations for achieving the best performance, see section 3.3

3.1 About the TP-41 / TP-42

Using the **TP-41** *Component – S/PDIF Line Transmitter* with the **TP-42** *Component – S/PDIF Line Receiver* constitutes a *Component – S/PDIF Line* transmitter / receiver system. The **TP-42** receives the CAT 5 signal, decodes it and simultaneously distributes it to the YUV output.

The **TP-41** *Component – S/PDIF Line Transmitter* includes:

- A YUV[1] input on three RCA connectors
- A digital audio input (S/PDIF) on an RCA connector
- A CAT 5 output for signal transmission to the **TP-42**
- Individual level controls for the Y, U, and V signals
- Audio level control

The **TP-42** *Component – S/PDIF Line Receiver* includes:

- A YUV[1] output on three RCA connectors
- A digital audio output (S/PDIF) on an RCA connector
- A CAT 5 input for signal reception from the **TP-41**
- Individual level and EQ. controls for the Y, U, and V signals
- Audio level and EQ. controls

Kramer twisted pair adapters are an excellent way to solve remote monitoring requirements without using more costly coaxial cable or fiber, or wireless transmission systems.

1 Also known as Y, B-Y, R-Y, or Y, Pb, Pr

3.2 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

We recommend that you use shielded twisted pair (STP) cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our STP skew-free cable, Kramer **BC-SXTP**, is intended for transmitting VGA signals. Our non-skew-free cable, Kramer **BC-STP,** is intended for digital signals.
The compliance to electromagnetic interference was tested using STP cables, therefore we recommend using those cables.

Although unshielded twisted pair (UTP) cable might be preferred for long range applications, the UTP cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference. However, since the use of UTP cable might cause inconformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

3.3 Recommendations for Achieving the Best Performance

Achieving the best performance means:

- Use only good quality connection cables[1] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **TP-41, TP-42** away from moisture, excessive sunlight and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[2].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

2 For example, part number 2535-052001

4 Your Component – S/PDIF Line Transmitter and Line Receiver

This section describes the:

- **TP-41** *Component – S/PDIF Line Transmitter*, see section 4.1
- **TP-42** *Component – S/PDIF Line Receiver*, see section 4.2

4.1 Your TP-41 Component – S/PDIF Line Transmitter

For a description of the **TP-41**:

- Topside, see section 4.1.1
- Underside, see section 4.1.2

4.1.1 Your TP-41 Component – S/PDIF Line Transmitter Topside

Figure 1, *Figure 2*, *Figure 3* and *Table 1* define the **TP-41**:

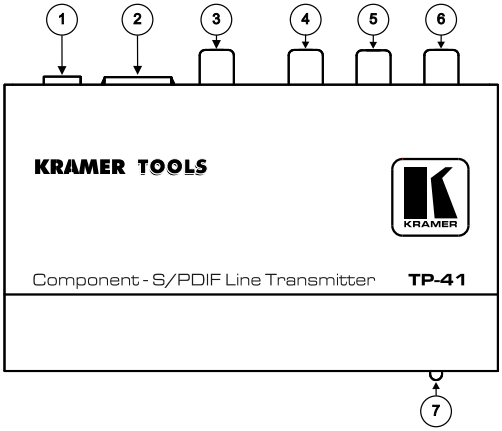


Figure 1: TP-41 Component – S/PDIF Line Transmitter

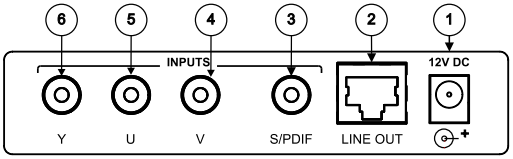


Figure 2: TP-41 Component – S/PDIF Line Transmitter (Top Side Panel)

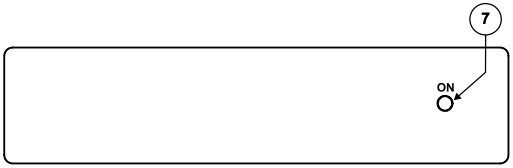


Figure 3: TP-41 Component – S/PDIF Line Transmitter (Lower Side Panel)

Table 1: TP-41 Component – S/PDIF Line Transmitter Features

#	Feature		Function
1	*12V DC*		+12V DC connector for powering the unit
2	*LINE OUT* RJ-45 Connector		Connects to the *LINE IN* connector on the **TP-42**[1]
3	INPUTS	*S/PDIF* RCA Connector	Connects to the digital audio source
4		*V* RCA Connector	Connects to the component video source
5		*U* RCA Connector	
6		*Y* RCA Connector	
7	*ON LED*		Illuminates when receiving power

4.1.2 Your TP-41 Component – S/PDIF Line Transmitter Underside

Figure 4 and *Table 2* define the underside of the **TP-41**:

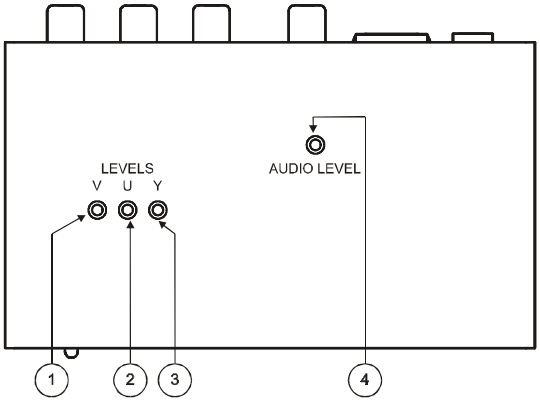


Figure 4: TP-41 Component – S/PDIF Line Transmitter Underside

Table 2: TP-41 Component – S/PDIF Line Transmitter Underside Features

#	Feature	Function
1	V LEVEL Trimmer	Adjusts[2] the V output signal level
2	U LEVEL Trimmer	Adjusts[2] the U output signal level
3	Y LEVEL Trimmer	Adjusts[2] the Y output signal level
4	AUDIO LEVEL Trimmer	Adjusts[2] the volume

1 Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in *Table* 5 and *Figure 10*)

2 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

4.2 Your TP-42 Component – S/PDIF Line Receiver

For a description of the **TP-42**:

- Topside, see section 4.2.1
- Underside, see section 4.2.2

4.2.1 Your TP-42 Component – S/PDIF Line Receiver Topside

Figure 5, *Figure 6*, *Figure* 7 and *Table* 3 define the **TP-42**:

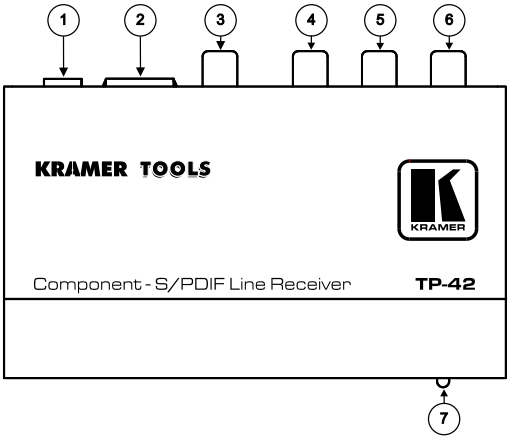


Figure 5: TP-42 Component – S/PDIF Line Receiver

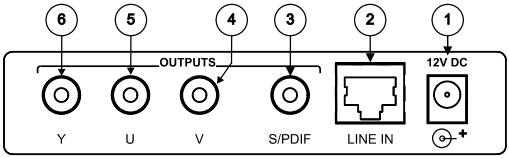


Figure 6: TP-42 Component – S/PDIF Line Receiver (Top Side Panel)

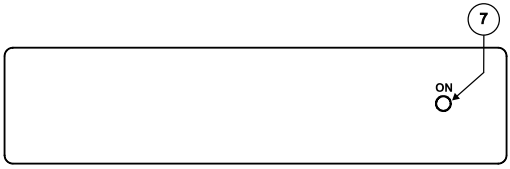


Figure 7: TP-42 Component – S/PDIF Line Receiver (Lower Side Panel)

Table 3: TP-42 Component – S/PDIF Line Receiver Topside Features

#	Feature		Function
1	*12V DC*		+12V DC connector for powering the unit
2	*LINE IN* RJ-45 Connector		Connects to the *LINE OUT* connector on the **TP-41**[1]
3	OUTPUTS	*S/PDIF* RCA Connector	Connects to the digital audio acceptor
4		*V* RCA Connector	Connects to the component video acceptor
5		*U* RCA Connector	
6		*Y* RCA Connector	
7	*ON LED*		Illuminates when receiving power

4.2.2 Your TP-42 Component – S/PDIF Line Receiver Underside

Figure 8 and *Table* 4 define the underside of the **TP-42**:

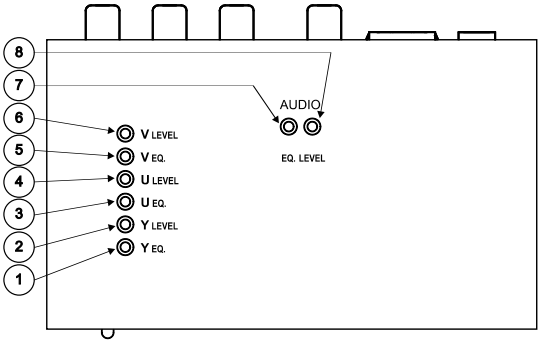


Figure 8: TP-42 Component – S/PDIF Line Receiver Underside

Table 4: TP-42 Component – S/PDIF Line Receiver Underside Features

#	Feature	Function
1	Y EQ. Trimmer	Adjusts[2] the cable compensation equalization level for output Y
2	Y LEVEL Trimmer	Adjusts[2] the Y output signal level
3	U EQ. Trimmer	Adjusts[2] the cable compensation equalization level for output U
4	U LEVEL Trimmer	Adjusts[2] the U output signal level
5	V EQ. Trimmer	Adjusts[2] the cable compensation equalization level for output V
6	V LEVEL Trimmer	Adjusts[2] the V output signal level
7	AUDIO EQ. Trimmer	Adjusts[2] the audio equalization level
8	AUDIO LEVEL Trimmer	Adjusts[2] the volume

1 Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in *Table* 5 and *Figure 10*)

2 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

5 Connecting a Component – S/PDIF Distribution System

To configure a **TP-41 / TP-42** Component – S/PDIF distribution system (for example, for high quality home cinema), as *Figure* 9 illustrates, do the following:

1. On the **TP-41**, connect a component video source (for example, a DVD player) to the:
   - Y, U, and V RCA (component video) INPUT connectors
   - S/PDIF (digital audio) RCA INPUT connector
2. On the **TP-42**, connect the:
   - Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma monitor)
   - S/PDIF (digital audio) RCA OUTPUT connector to an AV-Receiver
3. Connect the *LINE OUT* connector of the **TP-41** to the *LINE IN* connector of the **TP-42**, via UTP cabling (maximum range of up to 300ft (100m)).
4. On each **TP-41 / TP-42** unit:
   - Connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity[1]
   - If necessary, adjust[2] the appropriate level(s), by inserting a screwdriver into the small hole and carefully rotating it

1 Note, the TP-41, TP-42 does not have the power connect feature

2 On the TP-41, adjust the audio level and/or the Y, U, and V levels. On the TP-42, adjust the audio level, the audio EQ., the Y, U, and V levels, and/or the Y, U, and V EQ.

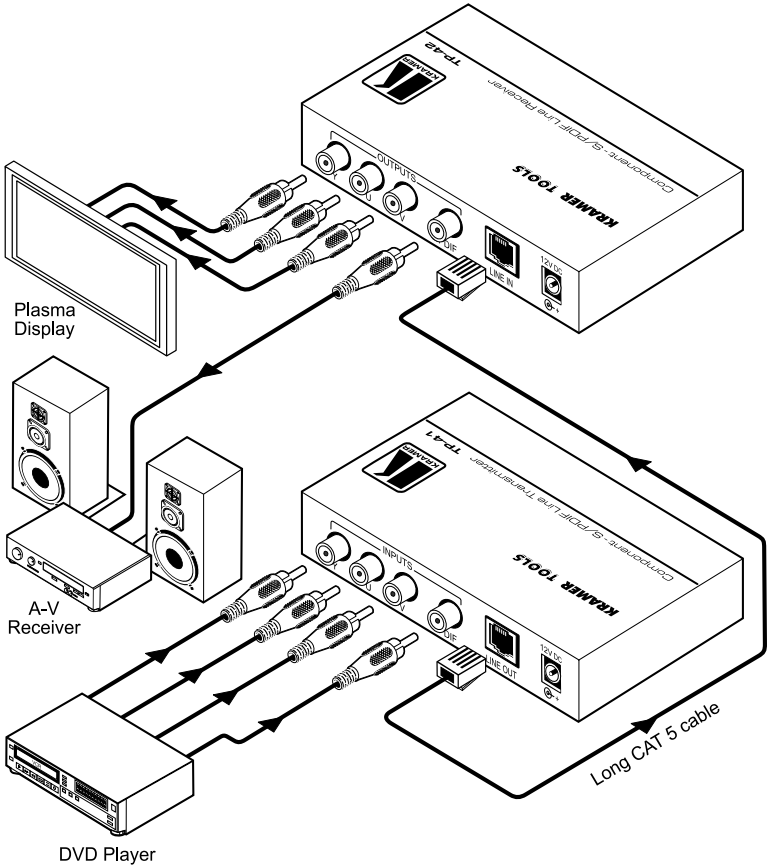


Figure 9: Component – S/PDIF Distribution System up to 300ft (100m) UTP Cable

5.1 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

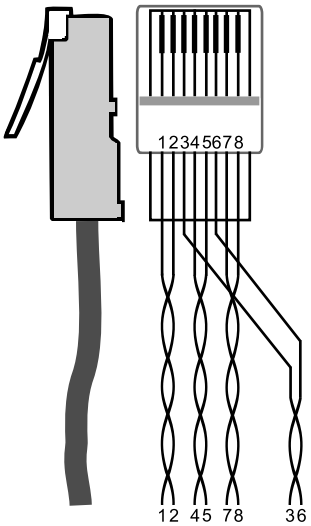
Table 5 and *Figure 10* define the CAT 5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Table 5: CAT 5 PINOUT

EIA /TIA 568A	
PIN	**Wire Color**
1	Green / White
2	Green
3	Orange / White
4	Blue
5	Blue / White
6	Orange
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	3 and 6
Pair 3	1 and 2
Pair 4	7 and 8

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

Figure 10: CAT 5 PINOUT



6 Technical Specifications

Table 6 defines the technical specifications:

Table 6: Technical Specifications[1] *of the TP-41 / TP-42*

INPUTS:	**TP-41**: 1 set of component video (Y, U, V) on RCA connectors 1 S/PDIF (digital audio) on an RCA connector	
	TP-42: 1 RJ-45 CAT 5 shielded connector (Line In)	
OUTPUTS:	**TP-41**: 1 RJ-45 CAT 5 shielded connector (Line Out)	
	TP-42: 1 set of component video (Y, U, V) on RCA connectors 1 S/PDIF (digital audio) on an RCA connector	
MAX. OUTPUT LEVEL:	VIDEO: 2.1Vpp	AUDIO: 2.1Vpp (S/PDIF)
VIDEO RESOLUTION:	Up to 1080i	
BANDWIDTH (-3dB):	AUDIO: 53.4MHz[2]	
DIFF. GAIN:	0.15%	
DIFF. PHASE:	0.68 Deg	
K-FACTOR:	0.8%	
S/N RATIO:	VIDEO: 78.1dB	AUDIO: 78.4dB
CROSSTALK (all hostile):	VIDEO: –55.5dB	AUDIO: –50.5dB
CONTROLS:	**TP-41**: YUV Level: –1.7dB to +0.7dB S/PDIF Level: –1.9dB to +0.4dB	
	TP-42: YUV Level: –0.7dB to +0.8dB YUV Equalization: 0 to +7.5dB S/PDIF Level: –0.5dB to +1.2dB S/PDIF Equalization: 0 to +7.8dB	
COUPLING:	VIDEO: DC	AUDIO: DC
POWER SOURCE:	**TP-41**: 12V DC, 95mA	
	TP-42: 12V DC, 82mA	
DIMENSIONS:	**TP-41** / **TP-42**: 12cm x 7.5cm x 2.5cm (4.7" x 2.95" 0.98", W, D, H)	
WEIGHT:	**TP-41** / **TP-42**: 0.3kg (0.67lbs) approx.	
ACCESSORIES:	Power Supply	

1 Specifications are subject to change without notice

2 Specifications for 100m of CAT5 UTP cable, unless otherwise specified

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: “Radio frequency devices Subpart B Unintentional radiators”

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

  * FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
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E-mail: info@kramerel.com
P/N: 2900-000041 REV 5